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P H I L O S O P H I C A L
T R A N S A C T I O N S.

XVI. *An abridged State of the Weather at London in the Year 1774, collected from the Meteorological Journal of the Royal Society.* By S. Horsley, LL.D. Sec. R. S.

ALTHOUGH the practice of keeping meteorological journals is, of late years, become very general, no information of any importance hath yet been derived from it. The reason of which perhaps may be, that after great pains and attention bestowed in registering particulars, as they occur, with a scrupulous minuteness, observers have not taken the trouble to form, at proper intervals of time, compendious-abstracts of their records, exhibiting the general result of their observations in each distinct branch of meteorology. The following tables are given as an example of the method that may be taken in future to remedy this neglect. With the general state of the barometer and thermometer, already given at the end of the meteorological journal, they form a history of the weather at London during the last year. If the example were to be followed, in different parts of the kingdom, we might in time be furnished with an experimental history of the weather of our island.

TABLE I.

An abridged View of the WINDS at LONDON, in the Year 1774, Compiled from the Meteorological Journal of the Royal Society.											
	N	S	E	W	NW	SE	NE	SW		Rain.	
January	1½	0	2	1½	4	2½	4	13	31	2,958	{ Five half-days omitted in the Journal.
February	1	1½	1	3	2	0	3½	16	28	2,360	
March	2	1½	1	1	½	3	14	7½	31	1,780	{ Half of a day missed in the Journal.
April	2½	3	2	4½	2½	2	5	8½	30	1,242	
May	3	½	3½	0	6	3	10½	4	31	1,413	{ An half-day missed in the Journal.
June	½	3½	2½	2½	4	2	1½	13½	30	2,273	
July	½	2	0	1	6½	2	1	18	31	2,438	
August	2	1½	0	1½	2	4	6	14	31	3,340	
Septemb.	1½	2½	1	2½	4	3½	6	9	30	3,917	
October	1	2½	1	2	3½	3	8	10	31	1,215	
Novemb.	7	1	1½	0	2½	1½	7	9½	30	1,586	
December	2½	1½	2	4½	6	3½	7½	3½	31	1,806	
	25	21	17½	24	43½	30	74	126½		26,328	

This table shews the number of days that each wind blew in each month, dividing the compass only into eight points, and reckoning all the winds between N. and W., N.W.; all between S. and E., S.E.; all between N. and E., N.E.; and all between S. and W., S.W. The number of days that each blew in all the months being collected into one sum at bottom, shews the number of days each wind blew in the whole year. The quantity of rain that fell in each month is added, that the connection between wet and dry, and the several winds may

the

the more readily appear. It appears that the winds from the S.W. prevailed more than any other in the year 1774; and next to the S.W. the N.E. But the S.W. was more frequent than the N.E. in the proportion of 126 to 74. Of the winds from the four cardinal points the North was the most frequent, and the East the most rare. In the three summer months, June, July, and August, there fell more rain than in the three of any other season. Of the 26,328 inches of rain which fell in the whole year, 13,842 fell in the winter half-year, consisting of the six months of September, October, November, December, January, and February, and 12,486 in the summer half-year, consisting of the six months of March, April, May, June, July, and August. So that

the winter's rain exceeded the summer's by 1,356^{inch}; that is, by little more than $\frac{1}{10}$ th part of half the rain of the whole year. September gave the greatest quantity of rain, and October the least of any single month in the whole year.

In collecting the rain of the several months, my rule, with respect to what hath sometimes fallen in the night between the last day of one month and the first of the next following, hath been this. When it appears by the journal, that it was fair on the last day of the month, at the time of the afternoon observations, I have given the whole of the ensuing night's rain to the new month; but if it rained on the last day of the month, at the time of the afternoon observation, I have divided the night's

rain equally between the new month and the old one. For instance, it appears by the journal that 0,043 fell in the night between the last day of February and the first of March. The whole of this I have placed to the account of March; because it was fair at the time of the afternoon observation on the last day of February. Again, in the night between the last day of September and the first of October, there fell 0,347. Half of this I give to September's rain and half to October's; because it rained the last day of September at the time of the afternoon observation.

TABLE II.

Sub-division of the S.W.				
	WSW	SW	SSW	
January	2	9½	1½	13
February	4	7½	4½	16
March	1½	4½	1½	7½
April	3	3	2½	8½
May	½	2	1½	4
June	1	9	3½	13½
July	5	9	4	18
August	5½	4½	4	14
September	2	1½	5½	9
October	2	5	3	10
November	2½	5	2	9½
December	1	2	½	3½
	30	62½	34	126½

TABLE III.

Sub-division of the N.E.				
	ENE	NE	NNE	
January	2½	½	1	4
February	0	2½	1	3½
March	2½	9	2½	14
April	½	3½	1	5
May	2	8½	0	10½
June	0	½	1	1½
July	0	½	½	1
August	2	1	3	6
September	1	1	4	6
October	2½	3½	2	8
November	4	1½	1½	7
December	1½	3½	2½	7½
	18½	35½	20	74

In these two tables the winds between the W. and the S.W. are all set down to the W.S.W.; and those between the S. and the S.W. are all reckoned S.S.W. In like manner,

ner, the winds between the E. and N.E. are all reckoned E.N.E.; and those between the N. and N.E. are all reckoned N.N.E. It appears that of the winds between the S. and W. those from the point of S.W. were far more frequent than those from either side of it. And the winds from the point of N. E. more frequent than those on either side of it, nearly in the same proportion.

TABLE IV.

Sub-division of the S.E.				
	ES.	SE	SSE	
January	1½	1	0	2½
February	0	0	0	0
March	½	1½	1	3
April	0	1	1	2
May	0	0	3	3
June	0	1½	1½	2
July	½	0	1½	2
August	1	2½	1½	4
September	0	1½	2	3½
October	½	1½	1	3
November	0	1	½	1½
December	0	2½	1	3½
	4	14	12	30

TABLE V.

Sub-division of the N.W.				
	WNW	NW	NNW	
January	½	2½	1	4
February	1	1	0	2
March	0	½	0	½
April	½	1½	½	2½
May	½	3½	2	6
June	1½	1½	1	4
July	2	4½	0	6½
August	0	1½	½	2
September	2	1	1	4
October	0	3½	0	3½
November	1	½	1	2½
December	2½	3½	0	6
	11½	25	7	43½

By these two tables it appears, that of all the winds between the N. and W. those from the point of N.W. were far more frequent than those from either side of it. Of the winds between the S. and E. those from the point of S.E. were more frequent than those to the E. of that point, and rather more frequent than those to the S. of it;

it; but the difference in the latter case was very inconsiderable. Of the winds from all quarters, those from the E.S.E and N.N.W. were the most rare, especially the former. The numbers in the last columns of each of the four last tables are the sums of the preceding columns ranging in the same horizontal lines. They ought to correspond with the numbers in columns S.W. N.E. S.E. N.W. of TABLE I. respectively, and serve as a check upon the work in making the tables.

The general state of the winds collected from the five preceding tables, according to their different degrees of prevalence, is as follows:

ESE	NNW	WNW	SSE	SE	E	ENE	NNE	S	W	NW	N	WSW	SSW	NE	SW	
4	7	11½	12	14	17½	18½	20	21	24	25	25	30	34	35½	62½	361½

Days missed in the Journal,

- - - - - 34
365

TABLE

TABLE VI.

Shewing the number of fair and frosty days in each half month and in the whole year.

	Fair		Fair days in whole month.	Frosty days		Frosty days in whole month.	
	1st half.	Latter half.		1st half.	Latter half.		
January	9	6	15	10	7	17	
February	7	3	10	6		6	
March	7	13	20	4		4	
April	11	8	19				
May	8	6	14				
June	10	6	16				
July	6	8	14				
August	9	8	17				
September	7	2	9				
October	12	10	22				
Novemb.	5	6	11		1	1	
December	6	13	19	5	3	8	
Total fair days,			186	Total frost,			36

There were but 10 days in the whole year that gave any snow; viz.

3 in January, 1 in February, 5 in November, and 1 in December. The first snow on the 9th of January in the afternoon, after a rainy morning, set in with a N.N.E. wind, and was succeeded by a sharp frost

for three days and a half, with the wind E.N.E. The second, which happened in the night between the seventeenth and eighteenth, came likewise after rain, and was succeeded by a frost of four days and a half, wind shifting between N.W. and S.E. The last snow in January, on the 24th, fell with a S.W. wind, which set in the day before. It was followed by a moderate frost of

one

one day, though the wind continued in the S.W. The snow on the 1st of February came with a S.W. during a sharp frost. The wind was in the N.E. before the snow, and returned to the same point the next morning; the frost sharper than before the snow. The snows in the latter part of November were generally accompanied with rain, and did not bring actual frost. The snow on the 9th of December came after two days frost, which it seems to have put an end to. For though it froze in the evening after the snow, the frost was much less severe than the preceding night, and a thaw came with rain, wind N.E., the next day.

There were only two thunder storms this year, *videlicet*,

August 27. 2 P.M. Barometer 29,64 inches, Thermometer 63°, Wind N.W.

September 24. 9 P.M. Barometer 29,42 inches, Thermometer at 2 P.M. 64°.

T A B L E VII.

For Trial of the Influence of the WINDS upon the BAROMETER.															
	SW	WSW	SSW	NE	ENE	NNE	SE	ESE	SSE	NW	WNW	NNW	N	S	E W
Jan.	29,37	29,61	29,60	29,34	29,64	29,58	29,57	29,72		29,66	29,895	29,675	29,72		29,80 29,67
Feb.	29,63	29,81	29,70	30,30		30,41				29,73	29,615		29,69	29,86	29,85 29,90
Mar.	29,39	29,79	29,89	29,945	29,87	30,20	29,52	29,88	29,52	29,615			30,14	29,87	29,90 29,75
April	29,77	30,07	29,61	29,95	30,21	29,80	30,00		29,69	29,80	29,58	29,90	29,82	29,475	29,53 29,80
May	29,91	29,46	29,45	29,96	29,86				29,71	29,81	29,97	30,04	29,98	29,34	29,925
June	29,91	29,92	29,80	30,21		29,75	29,92		29,95	30,00	29,69	29,87	29,60	29,83	29,84 30,09
July	29,97	29,97	29,98	29,92		30,33		29,78	29,97	30,07	30,085		30,26	30,25	29,94
Aug.	29,97	29,85	29,80	29,95	30,00	30,17	30,05	30,07	29,535	29,960		30,12	30,13	29,74	29,98
Sept.	29,89	29,80	29,70	29,97	29,82	29,94	29,51		29,56	29,925	29,82	29,94	29,85	29,64	29,775 29,76
Oct.	29,98	30,28	30,225	30,32	29,865	30,23	30,15	29,54	30,18	29,98			30,19	30,22	29,95 30,27
Nov.	29,74	29,91	29,92	29,79	29,73	29,53	29,84		29,86	29,81	29,74	29,90	29,93	29,61	29,54
Dec.	30,07	29,795	29,71	30,15	29,82	30,38	29,62		29,20	30,21	30,31		30,38	29,64	29,90 30,51
Means	29,76	29,92	29,80	30,02	29,82	30,01	29,80	29,81	29,70	29,94	29,93	29,92	29,99	29,80	29,80 30,02

It is an old observation, that a N.E. wind in this country generally makes the barometer rise. This naturally leads to an enquiry, whether there be any general connection of the rise and fall of the barometer with the setting of the wind. Upon comparing the general account of the barometer for the year 1774, as stated at the end of the meteorological journal, with the journal at large, I found, that in seven months out of the twelve the greatest height of the barometer was accompanied with a North-easterly wind; and in eight months out of the twelve, the least height of the barometer was accompanied with a S.W. This incited me to take the trouble of making out the preceding table, which shews the mean height of the barometer which accompanied each wind in every month, and for the whole year. And it appears, that though the barometer may be almost at any height with any wind, yet the mean height was greater, in the course of the last year, with the winds which set from that semicircle of the compass, which is intercepted between the points of W.S.W. inclusive and E.N.E. exclusive, going round by the W. and N. than with the winds which set from the opposite semicircle intercepted between E.N.E. inclusive and W.S.W. exclusive, going round by E. and S. In the former semicircle the W. and N.E. give the greatest mean height, and in the latter the S.S.E. and S.W. give the least*.

* It is to be noted, that the means of the whole year, stated in the lowermost horizontal row, are not found by collecting the means of all the months into one sum, and dividing by the number of months (for this method would always be fallacious, except each wind had blown for the same number of days in all the different months); but by adding together the heights attending each wind day by day, and dividing the sum by the number of days each wind blew in the whole year.

For Trial of the moon's Influence.									
	Last Qr.		New.		First Qr.		Full.		
	D. H.	D. H.	D. H.	D. H.	D. H.	D. H.	D. H.		
Jan.	5	6	11	21	19	3	27	7	$\begin{array}{ccccccc} \overset{\sim}{+} & \overset{\sim}{\circ} & \overset{\sim}{+} & \overset{\sim}{*} & \overset{\sim}{\circ} & \overset{\sim}{+} & \overset{\sim}{\circ} & \overset{\sim}{+} & \overset{\sim}{\circ} & \overset{\sim}{-} & \overset{\sim}{-} & \overset{\sim}{\circ} \\ \overset{\sim}{6} & \overset{\sim}{7} & \overset{\sim}{9} & \overset{\sim}{10} & \overset{\sim}{14} & \overset{\sim}{18} & \overset{\sim}{23} & \overset{\sim}{25} & \overset{\sim}{26} & \overset{\sim}{30} \end{array}$
Feb.	3	15	10	9	18	0	25	23	$\begin{array}{ccccccc} \overset{\sim}{+} & \overset{\sim}{\circ} & \overset{\sim}{+} & \overset{\sim}{\circ} & \overset{\sim}{+} & \overset{\sim}{\circ} & \overset{\sim}{+} & \overset{\sim}{\circ} \\ \overset{\sim}{4} & \overset{\sim}{7} & \overset{\sim}{8} & \overset{\sim}{10} & \overset{\sim}{13} & \overset{\sim}{15} & \overset{\sim}{17} & \overset{\sim}{20} \end{array}$
Mar.	4	22	11	22	19	20	27	11	$\begin{array}{ccccccc} \overset{\sim}{+} & \overset{\sim}{\circ} & \overset{\sim}{+} & \overset{\sim}{\circ} & \overset{\sim}{+} & \overset{\sim}{\circ} & \overset{\sim}{+} & \overset{\sim}{\circ} \\ \overset{\sim}{4} & \overset{\sim}{8} & \overset{\sim}{28} & \overset{\sim}{29} \end{array}$
Apr.	3	5	10	12	18	15	25	22	$\begin{array}{ccccccc} \overset{\sim}{+} & \overset{\sim}{\circ} & \overset{\sim}{+} & \overset{\sim}{\circ} & \overset{\sim}{+} & \overset{\sim}{\circ} & \overset{\sim}{+} & \overset{\sim}{\circ} \\ \overset{\sim}{4} & \overset{\sim}{8} & \overset{\sim}{28} & \overset{\sim}{29} \end{array}$
May	2	12	10	3	18	7	25	5	$\begin{array}{ccccccc} \overset{\sim}{+} & \overset{\sim}{\circ} & \overset{\sim}{+} & \overset{\sim}{\circ} & \overset{\sim}{+} & \overset{\sim}{\circ} & \overset{\sim}{+} & \overset{\sim}{\circ} \\ \overset{\sim}{5} & \overset{\sim}{7} & \overset{\sim}{23} \end{array}$
							Last Qr. 31 20		
June	8	18	16	19	23	12	30	7	$\begin{array}{ccccccc} \overset{\sim}{\circ} & \overset{\sim}{+} & \overset{\sim}{\circ} & \overset{\sim}{+} & \overset{\sim}{\circ} & \overset{\sim}{+} & \overset{\sim}{\circ} & \overset{\sim}{+} & \overset{\sim}{\circ} \\ \overset{\sim}{6} & \overset{\sim}{17} & \overset{\sim}{18} & \overset{\sim}{20} & \overset{\sim}{22} & \overset{\sim}{28} & \overset{\sim}{30} \end{array}$
July	8	9	16	5	22	19	29	20	$\begin{array}{ccccccc} \overset{\sim}{+} & \overset{\sim}{\circ} & \overset{\sim}{+} & \overset{\sim}{\circ} & \overset{\sim}{+} & \overset{\sim}{\circ} & \overset{\sim}{+} & \overset{\sim}{\circ} \\ \overset{\sim}{5} & \overset{\sim}{15} & \overset{\sim}{20} & \overset{\sim}{22} & \overset{\sim}{27} & \overset{\sim}{31} \end{array}$
Aug.	7	0	14	12	21	3	28	12	$\begin{array}{ccccccc} \overset{\sim}{+} & \overset{\sim}{\circ} & \overset{\sim}{+} & \overset{\sim}{\circ} & \overset{\sim}{+} & \overset{\sim}{\circ} & \overset{\sim}{+} & \overset{\sim}{\circ} \\ \overset{\sim}{4} & \overset{\sim}{6} & \overset{\sim}{11} & \overset{\sim}{15} & \overset{\sim}{17} & \overset{\sim}{26} \end{array}$
Sept.	5	14	12	17	19	13	27	7	$\begin{array}{ccccccc} \overset{\sim}{\circ} & \overset{\sim}{+} & \overset{\sim}{\circ} & \overset{\sim}{+} & \overset{\sim}{\circ} & \overset{\sim}{+} & \overset{\sim}{\circ} & \overset{\sim}{+} & \overset{\sim}{\circ} \\ \overset{\sim}{1} & \overset{\sim}{5} & \overset{\sim}{7} & \overset{\sim}{11} & \overset{\sim}{13} & \overset{\sim}{14} & \overset{\sim}{17} & \overset{\sim}{20} & \overset{\sim}{22} \end{array}$
Oct.	5	3	12	0	19	2	27	3	$\begin{array}{ccccccc} \overset{\sim}{+} & \overset{\sim}{\circ} & \overset{\sim}{+} & \overset{\sim}{\circ} & \overset{\sim}{+} & \overset{\sim}{\circ} & \overset{\sim}{+} & \overset{\sim}{\circ} \\ \overset{\sim}{3} & \overset{\sim}{23} & \overset{\sim}{24} & \overset{\sim}{29} \end{array}$
Nov.	3	15	10	7	17	18	25	23	$\begin{array}{ccccccc} \overset{\sim}{\circ} & \overset{\sim}{+} & \overset{\sim}{\circ} & \overset{\sim}{+} & \overset{\sim}{\circ} & \overset{\sim}{+} & \overset{\sim}{\circ} & \overset{\sim}{+} & \overset{\sim}{\circ} \\ \overset{\sim}{2} & \overset{\sim}{6} & \overset{\sim}{7} & \overset{\sim}{18} & \overset{\sim}{21} & \overset{\sim}{26} \end{array}$
Dec.	3	2	9	17	17	12	25	17	$\begin{array}{ccccccc} \overset{\sim}{+} & \overset{\sim}{\circ} & \overset{\sim}{+} & \overset{\sim}{\circ} & \overset{\sim}{+} & \overset{\sim}{\circ} & \overset{\sim}{+} & \overset{\sim}{\circ} \\ \overset{\sim}{2} & \overset{\sim}{5} & \overset{\sim}{11} & \overset{\sim}{14} & \overset{\sim}{15} \end{array}$

This table exhibits a comparison of the actual changes of the weather from fair to foul, with the aspects of the Moon; and needs no other explanation than an interpretation of the characters in the last column.

— frost	} Any one of these marks placed over a number signifies, that the weather indicated by that mark continued from the day of the month denoted by the number underneath to the day denoted by the next following number, bearing some other mark over it.
+ thaw	
○ fair	
~ rainy	
~ stormy	
* snow	

Thus, in the month of July, rainy weather set in on the fifth, and lasted to the fifteenth; from the 15th to the 20th it was fine; when it changed again, and continued rainy till the 22d; then it was fine to the 27th, and rainy again till the 31st.

Such tables of comparison, made yearly for a succession of years, would in the end decide with certainty for or against the popular persuasion of the Moon's influence upon the changes of our weather; which hath some how or other gained credit even among the learned, without that strict empiric examination, which a notion in itself so improbable, so destitute of all foundation in physical theory, so little supported by any plausible analogy, ought to undergo. The vulgar doctrine about this influence is, that it is exerted at the syzygies and quadratures, and for three days before and after each of those epochs. There are 24 days therefore in each synodic month, over which the Moon at this rate is supposed to preside; and as the whole consists but of 29 days 12 $\frac{1}{4}$ hours,

hours, only $5\frac{1}{2}$ days are exempt from her pretended dominion. Hence, though the changes of the weather should happen to have no connection whatever with the Moon's aspects, though the fact should be, that they take place at all times of the Moon indifferently, and are distributed in an equal proportion through the whole synodic month; yet any one who shall predict, that a change shall happen on some one of the 24 days assigned, rather than on any one of the remaining $5\frac{1}{2}$, will always have the chances 24 to $5\frac{1}{2}$ in his favour. Merely because more changes will fall with in the greater time, and, upon an average, as many more in proportion as the time is greater. It is evident therefore, that this is a matter in which men may easily deceive themselves, especially in so unfettled a climate as that of this island: and the advocates for lunar influence are not to imagine they have fact on their side, unless it should appear, from such tables as these carefully kept for a long course of years, that the changes happening on the days, which they hold to be subject to the Moon, are more than those which happen on the exempted days, in a much greater proportion than that of 24 to $5\frac{1}{2}$.

The antiquity of the opinion may perhaps be alledged in its favour; and it may seem an answer to the objection taken from the instability of the weather of this part of the world, that it had its origin in more settled climates. We find it, it must be confessed, in the earliest Greek writers, who probably had it with the rest of their physics from the East. And to this circumstance, I

am persuaded, the opinion owes the credit it hath met with among men of learning. But whatever general assertions may be found in some writers, concerning celestial influences in general, and the Moon's in particular, as being of all the heavenly bodies the nearest to the earth, the writers who treat of the signs of the weather practically, for the information of husbandmen and mariners, derive their prognostics from circumstances, which neither argue any real influence of the Moon as a cause, nor any belief of such an influence; but are merely indications of the state of the air at the time of observation: namely, the shape of the horns, the degree and colour of the light, and the number and quality of the luminous circles which sometimes furround the Moon, and the circumstances attending their disappearance^(a). It is true, that each of these prognostics is expressly confined, by the early writers, to a particular time of the Moon's age^(b). But not, as I conceive, on account of any particular influence of the Moon in this or that aspect; but merely because the prognostics, that she affords at one age, are such in themselves as she cannot afford at another. For instance, the bluntness of the horns in the new Moon is a sign of approaching rain,

(a) See the *Διοσημεία* of Aratus and the Scholia of Theon.

(b) Σήμαίλα δ' ἔτ' ἄρ' πᾶσιν ἐπ' ἡμασι πάντα τέτυκται.

Ἄλλ' ὅσα μὲν τριτάτῃ τετραταίῃ τε πέληται,
 Μέσφα διχραιμένης· διχάδος γέ μιν ἄχρισ ἐπ' αὐτὴν
 Σημαίνει διχόμηνον· ἀτὰρ πάλιν ἐκ διχομήνης
 Ἐς διχάδα φθιμένην· ἔχεται δέ οἱ αὐτίκα τέτρας
 Μηνὸς ἀποιχομένην. Αρατ. Διοσημεία.

because

because it indicates a turbid state of the atmosphere; for if the air were clear and dry, the horns should appear sharp and pointed, that being then their natural shape. But the bluntness of the horns is no sign of change after the dichotomy; because then the horns will appear blunt in all states of the air, the elliptic arc on the deficient side of the Moon presenting its concavity to the circular limb, and forming with it an obtuse angle. Again, the degree of the Moon's light on the fourth day furnished a prognostic. It ought then to be strong enough, if the air was clear, for terrestrial objects to cast a shadow (c). If their shadows were not discernible, it was a sign that the air was impure, and bad weather was to be expected. But this prognostic did not take place *before* the fourth day, because the light of the Moon was yet too weak for shadows to be formed in the purest state of the air. It did not take place *after* the fourth day, because the enlightened part was then so much encreased, that shadows would be formed in any state of the air, if the Moon was not actually hidden by a cloud, or obscured by sensible mists. The prognostics furnished by the new Moon served only till the dichotomy, and those of the dichotomy till the full Moon, and so on; not because a new and distinct influence was exerted in each new aspect, but because each new aspect furnished a new set of signs, of a

(c) — ὅτε πρώτη ἀποσκίδαται αὐτόθεν αὐγή

Ὅσον ἐπισκιάειν ἐπὶ τέττατον ἡμᾶρ ἴσα. Αρατ. Διοσημεια.

Τίταρ' αἶα γενομένη ἡ σελήνη ἀρχήαι δύνασθαι σκιάζειν ἐν τῷ φωτὶ αὐτῆς· τριταίῃ γὰρ εὐύνεται διὰ τὴν περιχειμένην τῷ φωτὶς ἀδράνειακ.

Theon in locum.

different

different kind. That this is a true representation of the most ancient lunar prognostics, appears from hence; that others of a similar kind were derived from the Sun and the fixed stars, particularly the *Præsepe* and *Afelli* in Cancer, and the bright star in the Altar.; and it is remarkable, that ARATUS says, the prognostics taken from the Sun are the most certain of all^(d). The vulgar soon began to consider those things as causes, which had been proposed to them only as signs. The manifest effect of the Moon upon the Ocean, while the mechanical cause of it was totally unknown, was interpreted as an argument of her influence over all terrestrial things; and these notions were so consistent with that visionary philosophy, which assigned distinct places to corruption, change, and passivity, on the one side, and the active governing powers of nature on the other, and made the orb of the Moon the boundary between the two, that they who should have been its opponents, ranged themselves on the side of popular prejudice. And the uncertain conclusions of an ill-conducted analogy, and a false metaphysic, were mixed with the few simple precepts derived from observation, which probably made the whole of the science of prognostication in its earliest and purest state. Hence both THEOPHRASTUS and ARATUS teach us to remark the position of the Moon's horns, and take conjectures of approaching fair weather or tempest, according as they appear, at different times of the Moon's age, erect, reclined, or prone: not knowing

(d) Ηελίω καὶ μᾶλλον εἰκότα σήματα κεῖται. Διοσημεῖα.

that

that the position of the line joining the Moon's cusps, with respect to the horizon, depends merely upon the mutual approach, or recess, of the pole of a great circle drawn through the centers of the Sun and Moon, and the pole of the horizon, in the course of the diurnal revolution. And so great a man as VARRO, as he is quoted by PLINY, was not ashamed to give this childish rule, for predicting the weather, for a whole month to come, from appearances at the new Moon. "If the upper horn "be obscure, the decline of the Moon will bring rain. "If the lower horn, the rain will happen before the full. "At the time of the full Moon, if the blackness be in "the middle^(c)." After this one cannot be surprized, that the poet VIRGIL should make the prognostics of the fourth day decisive for the whole lunation:

*Sin ortu quarto, namque is certissimus auctor,
Pura neque obtusis per cælum cornibus ibit,
Totus et ille dies, et qui nascentur ab illo,
Exactum ad mensem pluviâ ventisque carebunt.*

Georgic. lib. 1. lin. 143.

But in this he contradicts ARATUS, whose authority in general he follows implicitly. With ARATUS, the signs of the new Moon extend only to the first quarter.

The ancients ascribed an influence to the constellations and fixed stars as well as to the Sun and Moon; and

(c) Apud Varronem ita est. ——— Nascens Luna si cornu superiore obatro surget, pluvias decrescens dabit: si inferiore, ante plenilunium: si in mediâ nigritia illa fuerit, imbrem in pleno. PLIN. Nat. Hist. lib. XVIII. cap. 35.

there seems to have been much the same foundation for one as the other. In the *paraëgmata* or calendars, introduced in Greece, as we learn from THEON (*f*), by the astronomer METON, and renewed either annually or, as I rather conjecture, at the expiration of every 19-year period, the heliacal risings and settings of different stars were marked as bringing in different sorts of weather. The truth is, the earliest astronomers imagined, that the weather was governed by the Sun; and that its varieties were every where owing to the different degrees of the Sun's heat in the different seasons. They had therefore taken great pains to collect, by a long series of observations, the weather that usually prevailed in this or that particular place during the Sun's passage through every degree of every sign. Upon these observations, not upon any whimsical theory of celestial influences, the predictions in the calendars were founded. It seemed reasonable to announce, as the weather of each part of the year, what had been found to be then most frequent. And while the civil reckonings of time were so different among the different Greek states, and so rudely digested in all, the heliacal risings and settings of the stars were the only certain and obvious marks, the compilers of those popular directories could hit upon, of the Sun's return to the different parts of the zodiac (*g*). Hence they proposed them

(*f*) Scholia in Aratum.

(*g*) Geminus. Εἰσαγωγή εἰς τὰ φαινόμενα. c. 14.

to the people as signals of the weather to be expected. The form of the year being now the same in all parts of Europe, and pretty accurately adjusted to the motions of the heavenly bodies, and the heliacal risings and settings of the stars, from the different manner of life of our country people, not falling so much under popular observation with us, as they did among the Greeks, they are not marked as prognostics in our modern almanacks: and this I take to be the reason, that though the Moon hath maintained her reputation amongst us, the influence of the fixed stars is sunk, as it well deserves, in utter oblivion. Upon the whole I do not deny, that the observant husbandman will find a variety of useful prognostics in the appearances of the Moon, and the heavenly bodies in general; but they will be prognostics of no other kind, and for no other reason (though perhaps less fallible) than the sputtering of the oil in the industrious maiden's lamp, or the excrescences which gather round the wick ^(b). They will be symptoms destitute of all efficient powers. They will shew the present state of the air, as that on which they depend, not as that which they

(b) Ne nocturna quidem carpentes pensa puellæ
Nescivere hiemem: testâ cum ardente viderent
Scintillare oleum, et putris concreescere fungos.

Georgic. lib. I. lin. 390.

Ἡ λύχνοιο μύκητες ἀγείρωνται περὶ μύξαν,
Νύκτι κατὰ σκοτίην, μηδ' ἢν ὑπὸ χείματος ὤρη
Λύχμαν ἄλλοι μὲν τε φάος κατὰ κόσμον ὀρώρη,
Ἄλλοι δ' αἰσσωσιν ἀπὸ φλόγης, ἥντε κῆφαι
Πομφόλυγες δευ.

Αρατ. Διοσημ.

govern, and may furnish probable conjectures for two or three days to come. To what I have already advanced in support of this opinion, I shall only add the last lines of the *Διοσημεία* of ARATUS. They speak the sentiments of the earliest ages most decisively, as they shew how little the doctrine of the influence of lunar aspect had gained ground, even in his days, among practical writers. That elegant versifier, there is little room to doubt, delivers the practical maxims of his time, just as he received them. He was too little of a poet to disguise the truth with ornamental fiction, and too little of a philosopher to adulterate it with hypothesis.

Τῶν μηδὲν καλόκησο, καλὸν δ' ἐπὶ σήμασι σῆμα
 Σκέπτεσθαι, μᾶλλον δὲ δυοῖν εἰς ταυτὸν ἰόντων
 Ἐλπωρὴν τελέθει· τριτάτῳ δὲ κε θάρασσεάς.
 Αἰεὶ δ' ἂν περιόλης ἀριθμοῖς ἐνιαυτῷ
 Σήμαλα, συμβάλλων εἶπε καὶ ἐπ' αἰθέρι τοίῃ
 Ὅπως ἀνέλλοι καί εἰσέρχεται, ἢ καλίωνι,
 Ὅποιον καὶ σῆμα λέγοι· μάλα δ' ἄρκιον εἶν
 Φράζεσθαι φθίνοντος, ἐφισταμένοιο τε μηνός
 Τετραδάς ἀμφοτέρων· αἱ γὰρ τ' ἄμυδις συνιόντων
 Μηνῶν πειρατ' ἔχουσιν, ὅτε σφαλερώτατος αἰθῆρ
 Ὀκλῶ νυξὶ πέλει, χήτει χαροπαῖο σελήνης.
 Τῶν ἄμυδις πάντων ἐσκεμμένος εἰς ἐνιαυτὸν,
 Οὐδέποτε σχεδὺς κεν ἐπ' αἰθέρι τεκμήραιο.

Which

Which I render thus : “ Neglect none of these prognostics [none, he means, of the great variety he hath enumerated, taken from the heavens, from animals, plants, terrestrial objects, &c.], it is a good thing to combine the observation of one prognostic with another. If two agree, there is the greater likelihood of the event, and a third makes it certain. Whatever you do, register [*ἀριθμοίης*] the prognostics of the current year, carefully noting what the prognostic says [*ὅπποῖον ἢ σήμα λέγοι* ; that is, what the event shew it to be a sign of], if such a sort of morning ⁽ⁱ⁾ comes on with the rise or setting of any particular star. And it will be of the

(i) *Such a sort of morning.* That is, a morning marked with such or such appearances. So I understand *τοίν ἡώς*. The spirit of the precept seems to be, that the heliacal risings of the stars are to be attended to, in conjunction with the particular appearances attending the dawn or sun-rise. The heliacal risings shew the season, or general constitution of the time of the year ; the particular appearances of the morning indicate the minute circumstances of the weather for two or three days to come. Thus the heliacal rising of Arcturus was a sign, in all the ancient paraegms, that the stormy season was at hand, and bad weather of various sorts, rain, thunder, high wind, was to be expected ; but what the particular weather would be for a day or two to come, whether it would be only windy, or wet, with thunder or without, from what quarter the bad weather would come, all this would be pre-signified by the particular appearances of the morning. Perhaps the same appearance may be subject to some variety of interpretation at different seasons of the year, and in different places. In this, experience and observation will be the only sure guides. And for this reason ARATUS advises his scholar, not only to attend to the general rules laid down for him, but to keep a journal for himself, and make his own conclusions.

“ highest importance to attend particularly to the two
 “ quaternions of the expiring and the incipient month^(k)
 “ [that is to the four last days of the month going out,
 “ and the four first of that which is setting in], for they
 “ comprise the extremities of the two months, where
 “ they meet : and the weather [or the state of the air]
 “ is then particularly uncertain [difficult to guess at] for
 “ eight nights, for want of the silver-coloured Moon.
 “ If you attend to all these put together, all through the
 “ year, you will never form a random guess about the
 “ weather.” The uncertainty of the weather for these
 eight nights cannot be an uncertainty of the effect depending upon the moon’s aspect; but it is an uncertainty of fore-knowledge, the poet speaks of, for want of the Moon as an index. For though the word:σφαλερώτατος by itself would be ambiguous, as it might be taken either in the sense of δυσόχαστος or εὐμετάβλητος, the words χήτει χαροποῖο σελήνης are decisive for the first interpretation. The moon exists during these eight months as at other times. There is no want of her therefore as a physical agent : the only want there can be, is the want of her

(k) And it will be of the highest importance to attend to, &c. μάλα δ’ ἄρκιν ἐν φράζεσθαι. I have sometimes thought these words might be rendered thus :
 “ This will be of great importance [that is, this joint observation of the general
 “ indications of season and of particular prognostics will be of great importance]
 “ in order to form a conjecture about the two quaternions, &c.” This interpretation would make the most connected meaning for the whole passage ; but I do not recollect, nor can I find upon the strictest search, any instance, wherein the verb φράζεσθαι is used in the sense of conjecturing, or forming a judgement or opinion about.

appearance. It would be unpardonable not to mention, that so great an authority as that of THEOPHRASTUS is against the side of the question to which I incline. The doctrine of the influence of lunar aspect is expressly asserted in his Treatise on the Signs of Rain and Wind. He says, that the new Moon is generally a time of bad weather, because the light of the Moon is wanting⁽¹⁾; and that the changes of weather generally fall upon the syzygies or quadratures. But this seems to have been merely an opinion founded upon an imaginary analogy between the epochs of syzygy and quadrature in the months, and the equinoctial and tropical epochs in the year. For the Moon, he says, is, as it were, the Sun of the night. THEOPHRASTUS, though a diligent observer of nature, was deep in the theory of that school, of which he was himself one of the brightest ornaments: and his testimony, with respect to the matter of fact, hath not, like ARATUS's, a credibility founded on the mediocrity of his genius.

In the table, p. 177. the changes which fell on the syzygies and quadratures, or on any one of PLINY's critical days of the Moon's age (which are the 3d, 7th, 11th, 15th, 19th, 23d, 27th,)) are distinguished from the rest by a larger character^(m). And out of 69 changes register-

(1) Διὸ καὶ αἱ συνόδοι τῶν μηνῶν χειμέριοι εἰσιν· ὅτι ἀπολείπει τὸ φῶς τῆς σελήνης, &c. THEOPHRAST. de signis Pluv. p. 417. Edit. Heins.

(m) Sunt et ipsius Lunæ octo articuli quoties in angulos solis incidit, plerisque inter eos tantum observantibus præfagia ejus, hoc est tertia, septima, undecima, decima quinta, vigesima tertia, vigesima septima, et interjunium. PLIN. Nat. Hist. lib. XVIII. c. 35.

ed in this table 32 claim that distinction. Which is rather a larger proportion of the whole number, than is due to the time made up of all the days of fyzygie and quadrature, in the whole year, together with PLINY's critical days, thrown into one sum. For since there were 365 days in the year, and the days of fyzygie and quadrature, with PLINY's critical days, amount to 113, out of 69 changes in the whole year 22 are as many as belong to these particular days, upon a proportional distribution. But in the preceding table, there are many alterations marked as changes, when it appears, that the weather returned to what it had been before the time of change, within the space of 24 hours after it. Now if we reject all these on both sides of the question (which I think is the fair way of reckoning, for sudden alterations, of so short a duration, are rather to be called irregularities than changes of weather), we shall find but 46 changes in all, from one settled state to another, of which only 20 fell on the days of fyzygies, quadrature, or PLINY's days, which is still more than the just proportion.

But again. PLINY's eight critical days were probably intended for the four days of fyzygie and quadrature and the four of octagonal aspect⁽ⁿ⁾. For if the time of the conjunction be rightly assumed, the mean quadratures, and the mean opposition, and the mean octagonal aspect, will always fall either on one of PLINY's days, or on the day next to it. The deviation, I sus-

(n) The words, Quoties in angulos solis incidit, imply this.

pect, was intentional, and for the sake of the odd numbers. Thus the 4th, 8th, and 12th days of the Moon should have been critical, instead of the 3d, 7th, and 11th, if the mean motions of the Moon had been the single thing attended to. But PLINY, or whoever was the first author of the rule he gives us, chose the latter as containing, besides much of the lunar influence, all the magic virtue of imparity, of which the others, taking their numerical denomination from even numbers, are totally destitute. Among the numerous believers in the Moon of our days, few, I suppose, retain any confidence in the physical powers of the odd numbers. They may imagine therefore, that the apparent inconsistency of PLINY's rule with the truth of things, may be owing to his superstition about the odd numbers, which led him wilfully to deviate from the mean epochs, little apprized (for the Romans never were astronomers) how much they sometimes differ from the true ones, on account of the great and various inequalities of the Moon's motions, and how very widely his arbitrary arrangement would in consequence often differ from the times it was intended nearly to represent. Instead of PLINY's critical days, I shall now, therefore, examine the days for which, I imagine, they were substituted; those I mean of true syzygie, true quadrature, and true octagonal aspect. The following table distinguishes the changes of weather which fell on these days. There were only 22 such out of all the 69; which is scarce four more than their even proportion. And rejecting, as before, on both sides,

the alterations of weather which were reverfed within the fpace of 24 hours, there remain out of 46 changes in all only 10 upon the days of lunar influence, which are two lefs than belong to them upon the even chance; for the days of fyzygie, quadrature, and octagonal afpect, in the whole year are 98; and $365 : 98 = 46 : 12\frac{1}{2}$ very nearly. It is remarkable, that of thefe ten changes two only coincide with a new Moon; namely, thofe of the 10th of February and 5th of September, and none at all with a full Moon. There were indeed two changes in the year upon the day of the full Moon; *videlicet*, thofe of the 20th of September and 18th of November; but both were reverfed within the fpace of 24 hours.

TABLE IX.

January	6 7 9 10 14 18 23 25 26 30	10	3
February	4 7 8 10 13 15 17 20	8	3
March	10	1	0
April	4 8 28 29	4	1
May.	5 7 23	3	0
June	6 17 18 20 22 28 30	7	3
July	5 15 20 22 27 31	6	1
August	4 6 11 15 17 26	6	2
September	1 5 7 11 13 14 17 20 22	9	4
October	3 23 24 29	4	1
November	2 6 7 18 21 26	6	3
December	2 5 11 14 15	5	1
		69	22

I have added in this table two columns, shewing the number of changes in each month, and the number out of each agreeing with the Moon.

I shall only add, that no conclusion must be drawn from the observations of a single year.